# MATTHEW WALKER

Teaches the Science of Better Sleep

MasterClass

# DREAM MACHINE

## Sleeping in Dr. Matthew Walker's class isn't just allowed—it's encouraged

**THE FUNNY THING** about studying sleep is, to understand its many benefits, you may have to deprive yourself of it almost entirely. Just ask Dr. Matthew Walker, the influential British neuroscientist and author of the international bestseller *Why We Sleep*.

Matthew is intimately familiar with the many health benefits of sleep. As a specialist in the study of slumber and the founder-director of the Center for Human Sleep Science at the University of California, Berkeley, he has examined how sleep affects the brain and body. He's analyzed everything from its role in Alzheimer's and depression to the ways it can facilitate learning and, potentially, extend our life expectancy. (Indeed, the center is a world leader in studying the effects of sleep on the mind and body.)

By the time Matthew arrived at UC Berkeley in 2007—hailing from Harvard Medical School, where he was a professor of psychiatry—he was already immersed in sleep research, although it was a field that he neither set out to join nor contribute more than 100 scholarly papers. It wasn't until the late 1990s, while pursuing his doctorate in neurophysiology at London's Medical Research Council, that Matthew recognized something alarming. Nobody in the history of science had been able to answer a simple question: Why do we sleep?

So he set up a sleep laboratory himself. First, he investigated the possible connections between sleep and certain types of dementia. After that, other connections: sleep and motor skills, sleep and emotional response, sleep and drug abuse, sleep and post-traumatic stress. For this pioneering research, he received funding awards from the National Science Foundation and the National Institutes of Health. He also got inspired.

In sleep, he'd found his muse, a mysterious and often evasive biological phenomenon—excellent fodder for a hardcover. *Why We Sleep*, recommended by *The New York Times* for "night-table reading in the most pragmatic sense" and endorsed by Bill Gates, arrived in 2017. It was a runaway success, both stateside and overseas, launching its author into the public intellectual stratosphere (the book has sold more than 1 million copies and has been translated into over 40 different languages). Matthew proceeded to deliver a viral TED Talk, appear on CBS's *60 Minutes* and NPR's *Fresh Air*, and help as a sleep consultant for Pixar and Google (among others). He's also a Kavli Fellow of the National Academy of Sciences and was recently awarded the prestigious Carl Sagan Prize for Science Popularization.

With this class, Matthew wants you to become more acquainted with sleep. He wants you to learn your chronotype, understand how snoozing impacts your memory, and figure out how sleep can slow down the physiological effects of aging. Ready to go catch those elusive Zs?

# THE SNOOZE NEWS

All of the stuff you ever wanted to know about sleep—and maybe a few things you never thought to ask

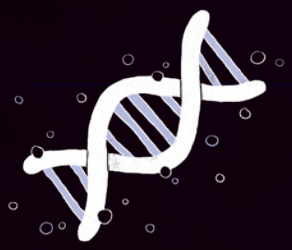
There are four stages of sleep, divided into Non-Rapid Eye Movement (NREM) and Rapid Eye Movement (REM):

### NREM STAGE 1
Transitioning from awake to asleep, very light

### NREM STAGE 2
Body temperature drops, heart rate begins to slow, slow-wave sleep may occur

### NREM STAGE 3
Blood pressure drops, breathing rate drops, deep, slow-wave sleep occurs

### REM
Eyes move rapidly, dreaming occurs, muscles are paralyzed so that dreams cannot be acted out



## 1 in 4 million
Likelihood you possess the genetic ability to feel well-rested after just four to six hours of sleep

## 8 HOURS
The length of composer Max Richter's *Sleep*, a classical piece based on sleep science (hence its duration)

## 90 million
Americans whose sleep is primarily disrupted by snoring

## "I can't get out of bed in the morning"
... is a real and chronic ailment. It's called dysania. Technically it's not medically recognized as a standalone diagnosis, but it often accompanies other afflictions (most commonly, depressive episodes)

**20% to 25%** Sleep time that humans devote to REM

**5% to 10%** Sleep time that other primates devote to REM

**10% to 15%** Increase in deep non-REM sleep that healthy adults experience when they take a hot bath before bed

**19** Hours without sleep before cognitive impairment is equal to being legally drunk

**18** Days it takes lab rats to die from sleep deprivation

## YOU CAN'T TRAIN YOURSELF TO SLEEP LESS
In related news, the human body also never gets used to night-shift work (i.e., due to your circadian rhythm, you're programmed to feel alert during the day and tired at night)

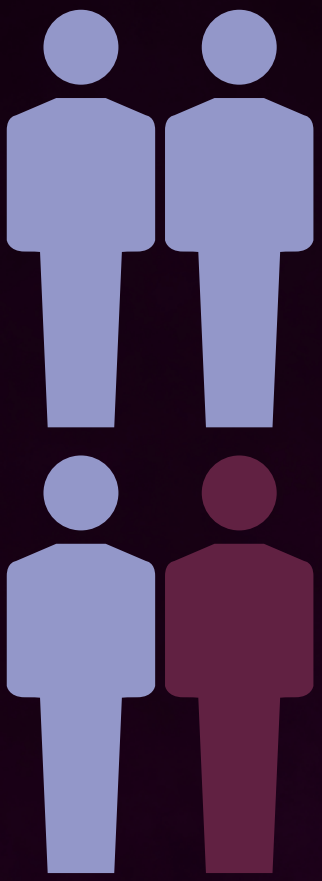
## ~800 million
People in developed countries who won't get enough sleep this week

## $411 billion
Estimated annual lost income from sleep deprivation in the U.S.

AUDREY MALO

# 3 in 4

Americans who reported "rarely" or "never" seeing color in their dreams in the late 1940s—before the advent of color television



# 200%

Increase in likelihood of heart attack or stroke among adults 45 years or older who sleep fewer than six hours

# 600

Extra calories, from snack foods, consumed by underslept participants in a study

# 1.2 MILLION

Estimated number of annual car accidents caused by sleepiness in the U.S.

## Humans are the only mammals that willingly delay going to sleep

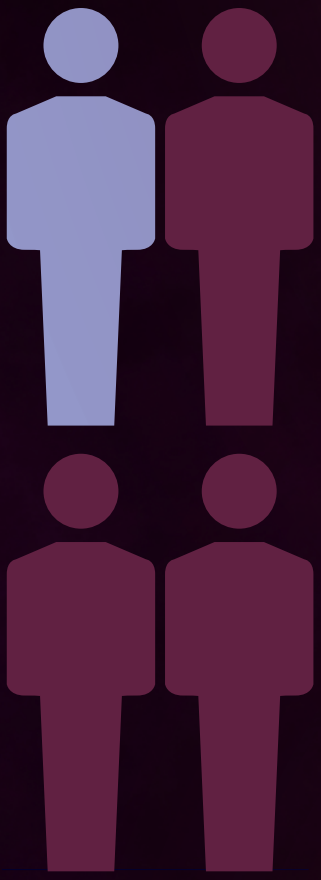
In fact, one main reason Americans report being sleepy is due to self-imposed sleep deprivation. (Who can go to bed when there are so many shows to binge?)

# 25 to 30 years

Cumulative time that most humans will spend sleeping during their lifetimes

# 1 in 4

The number of married couples who sleep in separate beds



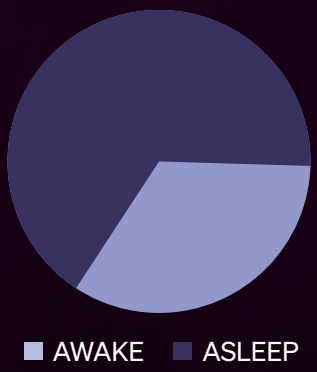
## 11

Days that Randy Gardner went sleepless for a Guinness World Records stunt, which is now forbidden. (Gardner, who suffered short-term memory loss, paranoia, and hallucinations, says he's now terrified of going a single night without sleep)

# THERE ARE THREE PRIMARY KINDS OF SLEEP HABITS

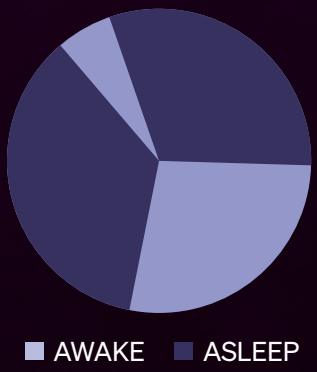
## Monophasic

Sleeping occurs in a single segment per day



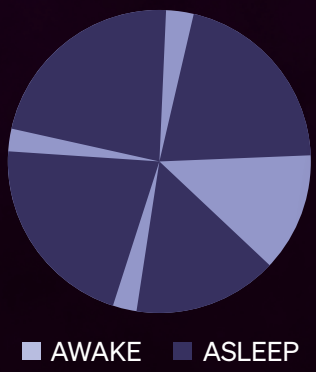

## Biphasic

Sleeping occurs in two segments per day



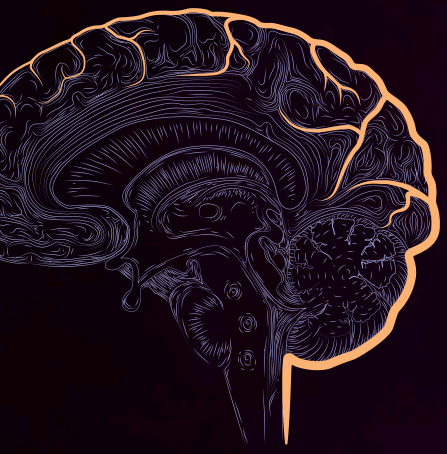

## Polyphasic

Sleeping occurs in short bursts throughout the day



# A NON-EXHAUSTIVE TIMELINE OF SLEEP SCIENCE

Before advanced computing, the mind at rest was as mysterious as the creatures roaming the deepest parts of the ocean. That didn't stop researchers from making breakthroughs



## 1729

French geophysicist Jean Jacques d'Ortous de Mairan shows that plants regulate time internally, using a biological circadian rhythm; the leaves of his *Mimosa pudica* continue to open daily, even without environmental cues

## 1845

John Davy, a British doctor, discovers that body temperatures and sleep patterns are not dependent on external environments

## 1875

Using his galvanometer, a device that measures electrical currents, Richard Caton records brain activity in animals, laying the groundwork for electroencephalogram (EEG) monitoring. The significance of his discovery won't be recognized until the 1930s

## 1880

Jean-Baptiste-Édouard Gélineau, a neuropsychiatrist from Bordeaux, introduces the term *narcolepsy* and makes the first diagnosis of that condition (an earlier case, which described "irresistible and incessant propensity to sleep," is now attributed to severe apnea)

## 1924

German psychiatrist Hans Berger records EEG signals in the human brain, noting different wave patterns in waking and sleeping brains

## 1938

Nathaniel Kleitman, a professor at the University of Chicago, and his research assistant venture into a cave to measure sleep in a pitch-black environment, concluding that the human circadian rhythm is approximately (but not precisely) 24 hours

## 1952

Kleitman and a graduate student named Eugene Aserinsky discover that babies' eyes move faster while sleeping. The brainwaves produced as a result are almost identical to those produced when awake. Hence rapid-eye movement sleep (REM), also known as the stage of sleep during which dreaming occurs

## 1968

Researchers standardize the four NREM (non-REM) stages of sleep, including deep ("slow-wave") sleep, wherein our neurons all fire together in a coordinated, meditative chant

## 1972

Through a study with rats, American researchers Friedrich K. Stephan and Irving Zucker discover the usefulness of the suprachiasmatic nucleus (SCN): It regulates circadian rhythm by sampling ambient light sent from each eye and adjusting discrepancies to maintain a 24-hour cycle

## 1988

Carlos Schenck and his colleagues find that some patients act out their dreams, injuring themselves or bed partners in the process. These sleep behavior disorders are the result of certain musculoskeletal systems that remain active during dreaming, whereas most remain paralyzed

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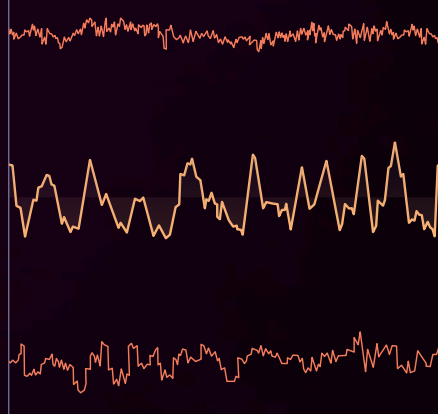
*Learn more about circadian rhythm and sleep fragmentation at masterclass.com.*



# FOWL PLAY

## Morning lark, night owl—are your sleep patterns hardwired at birth?

**LIKE LUSCIOUS LOCKS** and skin pigment, sleep preferences are baked into our genetics. From an evolutionary perspective, this makes a lot of sense: Variations in sleep patterns, called chronotypes, likely helped our ancestors survive. Staggering bedtimes would ensure that somebody was awake to alert the tribe at, say, saber-tooth o'clock.

The immutable nature of sleeping styles has a lot to do with the suprachiasmatic nucleus, or SCN. This small clump of cells—composed of approximately 20,000 neurons—sits at the intersection of your optical nerve, right in the middle of your brain. It serves as the body's atomic clock, tracking outside information (like ambient light) to determine whether you should be wrapped up in a comforter or going for a morning run. It also releases chemicals (like melatonin) that affect when you're able to fall asleep, among other physiological functions.

As you continue to age, your SCN releases different signals. To infant you, it says, "Get up and scream!" at 5 a.m.; to adolescent you, "Go ahead, watch scary movies way past bedtime." As adult you, it influences the time of day your body naturally falls asleep.

About 30 percent of the population doesn't have a strong, defined chronotype. But roughly 40 percent are physiologically primed to be morning larks—peak wakefulness arrives early in the day and they get sleepier earlier in the evening. The other 30 percent are ascribed night owls, wired for sacking out later and stirring later the following day. Unsurprisingly, this can cause problems in corporate America. For an owl who just went to bed at 3 a.m., hacking it at a nine-to-five may result in a measly four or five hours of shut-eye, depending on the commute and other morning obligations.

The discrepancy between chronotype and modern working hours is so prevalent that there's actually a dedicated term for it: social jet lag. It's the reason night owls forced to work in morning lark conditions can struggle with health problems, including obesity, diabetes, and heart disease. Once essential to the species, this type of chronotype variation can now be a liability—and a leading cause of chronic sleep deprivation.

Find out more about these two chronotypes with the handy chart on the next two pages—and see which famous faces are in your flock.

### Prime Time

Determining your own chronotype

UK Biobank, which tracks 500,000 subjects over 30 years to study inherited traits, has identified at least nine different genes believed to dictate chronotype. Curious about your own predisposition? Some commercial DNA testing and analyses, like 23andMe, can help you figure out the distribution of specific chronotype genes. The Horne-Ostberg Morning-Eveningness Questionnaire (AutoMEQ), available for free online, can also place you in one of five chronotypical categories, estimate your "natural" bedtime, and pinpoint at what time each day you experience the onset of melatonin, a vital sleep hormone.

*Are you a morning lark or a night owl? Learn more about chronotypes at masterclass.com.*

# MORNING LARKS...

## ...may be happier

A 2019 study published in *Nature Communications* assessed the sleep styles of 250,000 Americans via wrist-worn activity trackers. The results suggest that a genetic predisposition to waking early may be associated with a lower risk of mental health problems like schizophrenia and depression.

## ...tend to thrive in corporate settings

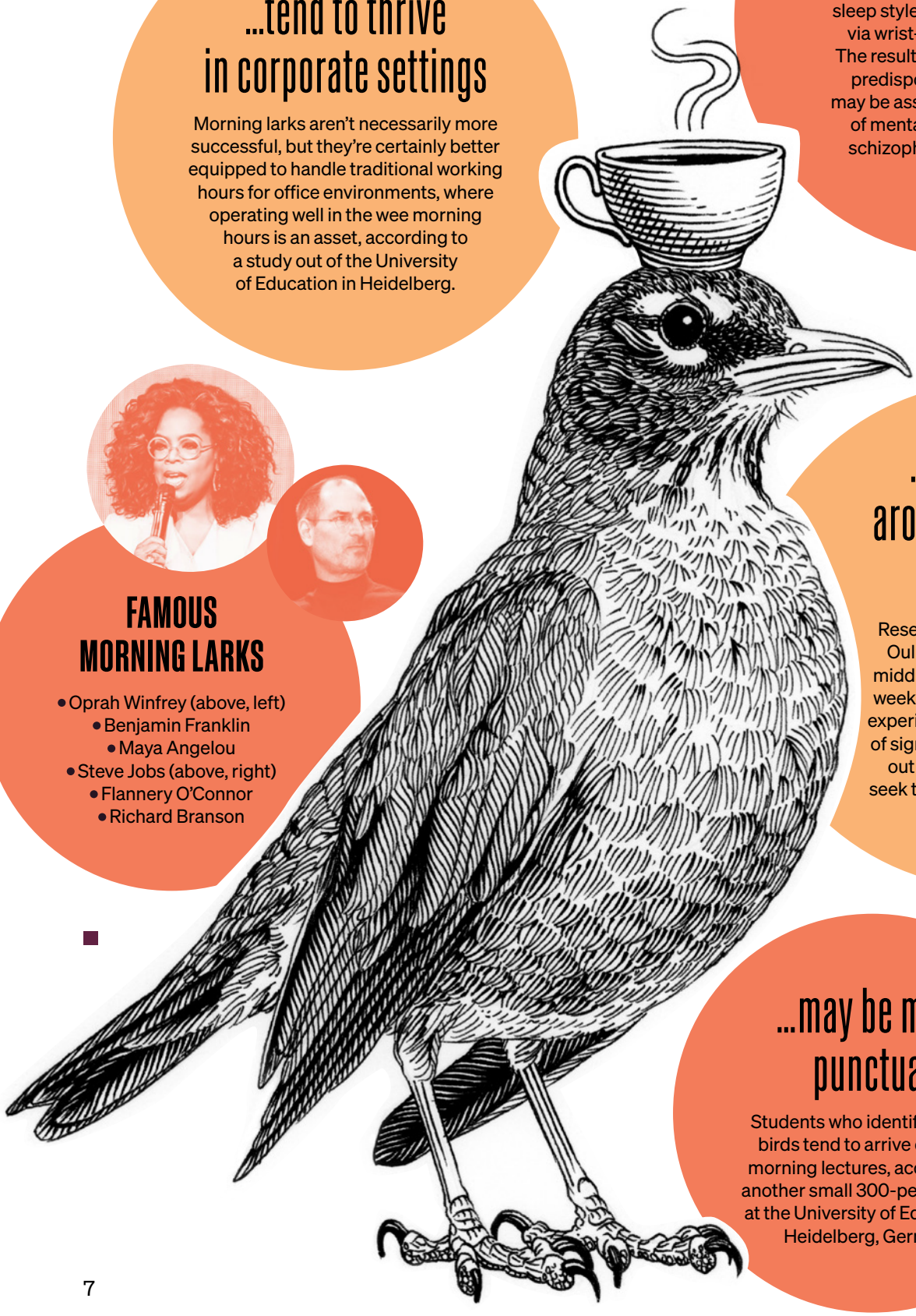
Morning larks aren't necessarily more successful, but they're certainly better equipped to handle traditional working hours for office environments, where operating well in the wee morning hours is an asset, according to a study out of the University of Education in Heidelberg.





## FAMOUS MORNING LARKS

- Oprah Winfrey (above, left)
- Benjamin Franklin
- Maya Angelou
- Steve Jobs (above, right)
- Flannery O'Connor
- Richard Branson



## ...tend to move around more during the day

Researchers at the University of Oulu in Finland tracked 6,000 middle-aged participants for two weeks and found that early risers experience 20 to 30 minutes more of significant movement throughout the day. The study did not seek to explain why evening types may be less active.

## ...may be more punctual

Students who identify as early birds tend to arrive earlier to morning lectures, according to another small 300-person study at the University of Education in Heidelberg, Germany.

OLIVIA KNAPP

# NIGHT OWLS...

## ...are more neurotic

In 2012, a survey of almost 3,000 college students in Taiwan found that night owls were more likely to be depressed, anxious, and suffer from obsessive tendencies. They also scored higher in the categories for "novelty-seeking" and "harm-avoidance."

## ...have their own society

The B Society of Denmark (motto: "Rise Late - Do Great") is on a mission to reduce social jet lag by advocating for later start times at offices and schools to better match society's work hours to our many different biological rhythms.

## ...drink more, smoke more, and have more sex

According to a 400,000-person study in the U.K., so-called definite evening types were more likely to drink and do drugs. Another smaller study, published out of Durham University in England, found that male night owls have about four times as many sexual partners as their early bird counterparts.

## ...have scarier dreams

A 2010 survey of nearly 4,000 people in Canada found that self-identified night owls were more likely to have vivid, severe nightmares, independent of age and sleep duration.

## FAMOUS NIGHT OWLS

- Barack Obama (left, top)
- Charles Darwin
- Marcel Proust
- Carl Jung
- Bob Dylan (left, bottom)
- Emily Brontë

## ...tend to be more creative

In a U.K. study of more than 20,000 teens and adolescents, those who self-reported later sleep schedules were more intelligent and creative, on average, than those who went to bed early.

# MIDNIGHT OILS

## How caffeine is impacting your sleep schedule (and how to fix it)

**ODDS ARE, YOU ALREADY KNOW THE BASICS:** Caffeine is widely cited as the world's most pervasive psychoactive drug, and it's regularly consumed by more than 85 percent of Americans. It's in your cold brew, your matcha, your soda, and many of the foods you're eating. Too much of the stuff and you may feel jittery or crash when it wears off—or you might have trouble sleeping at night.

First, understand that caffeine isn't *inherently* bad. It's an organic compound that occurs naturally in plants—most notably coffee, tea, and cocoa—where its bitter taste discourages pests. When consumed by humans, it has the neat by-product of temporarily altering certain brain signals, including those essential to sleep. In small doses—say, a piece of chocolate or a few ounces of coffee—the effects are generally mild. But high concentrations can confuse the mind and body, wreaking havoc on our natural rhythm.

Ergo, becoming a conscious consumer of caffeine is one easy way to become a better sleeper. Except conscious consumption is difficult. For starters, synthetic caffeine is often added to our ingestible products—some of them obvious (energy drinks), others less so (protein bars, aspirin). There are also disparities in nutritional labeling, and factors like serving size can skew your perceptions of concentration. Reducing your intake of caffeinated beverages is a simple concept. Compare a large iced chai with a medium cappuccino and a 40-ounce fountain soda, though, and it starts getting murky.

Here, it's best to moor yourself to some general reference points. According to the FDA, a typical 12-ounce soda contains 30 to 40 milligrams of caffeine. The average 8-ounce cup of green or black tea has 30 to 50 milligrams, while an 8-ounce cup of coffee packs closer to 80 to 100 milligrams. The agency also says that decaf coffee is a misnomer, as those varieties still contain 2 to 15 milligrams of caffeine per 8-ounce cup (see that chart at right for more info on the amount of caffeine in various products).

With these figures as a baseline, use a critical eye when grocery shopping or dining out. Be wary of coffee- and matcha-flavored foods, like yogurts and ice creams, which have upwards of 30 milligrams of caffeine per 6-ounce serving. Over-the-counter weight-loss supplements are, in many cases, glorified caffeine pills; a single tablet might contain 135 milligrams, so consider cutting them out entirely. If you're really looking to cut down, steer clear of products branded "energy"—even bottled waters or chewing gum.

Ready to put knowledge into action? Log your caffeine intake over the course of one week in a journal or on your phone. The following week, aim to reduce that figure by a realistic percentage. You may be surprised at how easy it is to trim consumption and the degree to which it positively impacts your sleep.

LEAST CAFFEINE

MOST CAFFEINE

Midol Complete
60 mg per tablet

CLIF Mint Chocolate
49 mg per bar

Excedrin Extra Strength
65 mg per tablet

Monster Energy Drink
160 mg per can (16 oz.)

5-Hour Energy
215 mg per shot (2 oz.)

Diet Coke
46 mg per can (12 oz.)

Coffee
80 to 100 mg per cup (8 oz.)

Health-Ade Kombucha
16 to 30 mg per bottle (16 oz.)

Hershey's Special Dark Chocolate
25 mg per bar

# IN DEFENSE OF NAPPING

A few minutes of extra sleep can pay huge dividends. Doubly so in our modern state of chronic exhaustion. People: It's time to reclaim the nap

**WHEN THE U.S. ARMY** dropped its revised fitness manual in October 2020, it included a curious new recommendation: strategic napping. The guidebook, meant to "build physical lethality and mental toughness," espouses the benefits of "short and infrequent" bouts of sleep in order to "restore wakefulness and promote performance."

It's not the first time napping has been rebranded with such vigor. In 1990, sleep researcher David Dinges and NASA expert Mark Rosekind published a study on scheduled rest for pilots during long-haul flights. They devised experiments to see if attention lapses—and, more ominously, midair "microsleeps"—could be minimized with shut-eye at specific intervals. They succeeded. But the Federal Aviation Administration didn't like the sound of "planned napping." And so the "power nap" was born.

But did dozing off really need a new pitch? Hugely influential figures, from Albert Einstein to Winston Churchill, are said to have indulged in the act. It's not a modern phenomenon, either; napping was written about in the Qur'an, a text dating to the 1st century. Still, modern-day proponents of the nap say they're fighting an uphill battle. Despite reports about the efficacy of napping, stigmas about laziness persist.

Which is a shame, because evidence suggests we desperately need the rest. According to surveys, the typical American adult gets an average of six hours and 31 minutes of sleep on work nights—well below the seven to nine hours needed for a healthy system. Rates are lower in other industrialized nations like Japan, where the average adult gets six hours and 22 minutes. But while Japan encourages napping at work, most American employers can't wrap their heads around a simple idea: To avoid lying down on the job, sometimes we need to *actually* lie down on the job.

There are signs of progress, though. Google and Ben & Jerry's have installed napping pods—which look similar to MRI machines or phone booths—at the office. Experts say these winks can increase relaxation, reduce fatigue, and improve mood. Whether we're on the front line or pushing through spreadsheets, a small respite can make a huge difference.

## Three Keys to a Solid Siesta

1. Keep it short and sweet; you only need about 20 minutes of sleep to boost your mood and energy levels.
2. Try napping in the early afternoon; dozing off after 3 p.m. can mess with your nighttime sleep.
3. Create a restful environment; dark, quiet, and cool (around 65°F) is ideal.

WESLEY ALLSBROOK

# MIND GAMES

Until the 1950s, people believed the brain was inactive during sleep. Nothing could be further from the truth

**WHEN WE SLEEP,** our brain gets a chance to reformat its proverbial hard drive, allowing storage of new and useful information. Dreaming, scientists believe, allows the retrieval of memories in a neurochemically neutral environment, potentially allowing us to better process painful experiences. The deep-sleeping brain can even problem-solve, giving new meaning to that age-old expression *Why don't you sleep on it?*

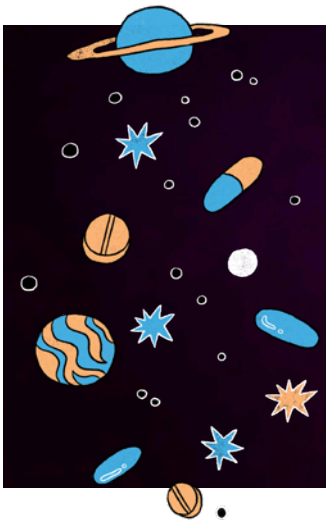
Indeed, there's a lot going on inside your noggin after bedtime. But the process starts during the day. When you're awake, your body produces adenosine, a chemical that makes you drowsy. This continues to accumulate for roughly 16 hours, until you register the feeling of exhaustion. (It takes about eight hours to clear your adenosine cache, hence the recommended nightly sleep quotient.) Once you settle down and drift off, the brain's vital regions begin to communicate and machinate, conspiring to enable productive sleep—and facilitate dreams.

The hypothalamus, roughly the size of a peanut, is a leading agent. It contains the suprachiasmatic nucleus (SCN), a bundle of nerves responsible for regulating your internal clock, indicating when it's time to pass out. The brain stem—charged with controlling vital bodily functions like blood pressure, heart rate, and breathing—is a hypothalamus collaborator, working to reduce activity in the brain's arousal centers. Crucially, the brain stem also relaxes your body during REM sleep so you don't act out your dreams.

During REM sleep, the amygdala and cingulate cortex, known as the deep emotional centers, go into overdrive. These regions are up to 30 percent more active compared with when you're awake. The increase leads researchers to believe that deep emotional processing might occur while dreaming. Meanwhile, the prefrontal cortex, which manages rational thought and decision-making, shuts off once the dreaming stage of REM begins.

This could explain why so many of our dreams seem nonsensical and our self-awareness is so limited (see how Hollywood handles trippy dream sequences on page 19). Much of how we sleep and dream remains a mystery, but we do know this: Regardless of how conked-out your body appears—or how anarchic your dreams feel—your brain is hard at work. When the lights go down, the real action begins.

*Get tips for improving your REM sleep (and learn more about the importance of non-REM sleep) at masterclass.com.*



## Tough Pills

Making sense of melatonin

The suprachiasmatic nucleus, or SCN, helps time the release of melatonin, a hormone that regulates our sleep/wake cycle. In the U.S., this chemical is available as an over-the-counter supplement, but it's not subject to strict government regulation. Accordingly, the actual melatonin concentration of these pills varies wildly—from 80 percent less to 460 percent *more* than what's stated on the bottle. (Concentration can also vary batch to batch, even from the same brand or vendor.) Matthew says people typically take too much anyway—between 2.5 mg and 5 mg—when physicians generally recommend 0.5 mg to 2 mg. His advice? Ask your doctor. If you've had success taking a small amount (and you can be sure of the origin and quality), it's probably no harm, no foul. And while Matthew says melatonin supplements can be "somewhat efficacious" for inducing sleep, he offers a dose of truth, too: They won't help you stay asleep or increase the quality of your rest.

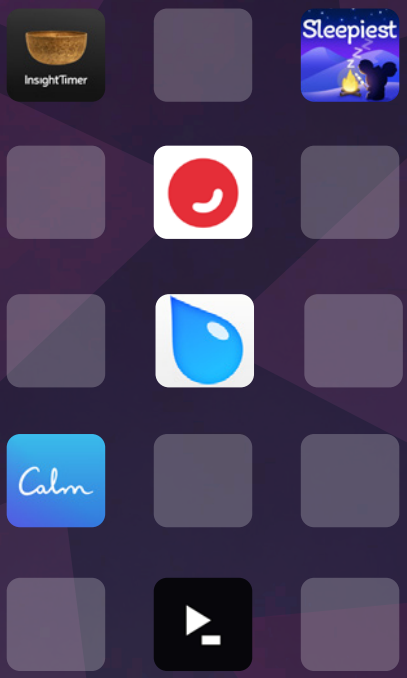
AUDREY MALO

## INSIGHT TIMER

This app includes some 3,000 free guided meditations plus several hundred accompanying music tracks, body scans, and soundscapes. Upgrading to the paid membership grants access to courses on overcoming insomnia and redefining your approach to sleep.

## SLEEPIEST

When your children don't sleep, you don't sleep. This app's library of audio tracks offers a whimsical solution: bedtime stories. You'll find blue-ribbon classics (*Cinderella, The Secret Garden*) as well as options for bigger kids (*Sherlock Holmes*) and original tall tales. Build a playlist of family favorites for maximum tranquilizer effect.




## TEN PERCENT HAPPIER MEDITATION

Among the most comprehensive apps of its kind, Ten Percent Happier has a devoted sleep section replete with relaxing body scans and tension-release sessions lasting anywhere from three to 30 minutes. Lectures tied to current events are a potential boon for anxiety sufferers.

## RAIN RAIN

Instead of casting a wide net, Rain Rain focuses on a time-honored sleep soundtrack: water noises. It offers aquatic din in nearly every conceivable form—brewing storm, ocean waves, thunder and lightning, rain on a tent, woodland downpour. If these types of sounds are your path to sleep, the selection here will knock you right out.

## CALM

The most popular meditation app on the block, Calm has oodles of resources for the chronically sleep-deprived, including soothing "sleep stories" (read by Matthew McConaughey), relaxing soundscapes, and guided bedtime meditations to calm your nerves, relax your muscles, and release internal pressure to fall asleep.

## IDAGIO

Studies show that calming classical music can help reduce sleeping problems. The Idagio streaming app focuses exclusively on the genre. Its simple interface includes a "mood ring," which functions like the iPod scroll-wheel of old; dial it to Gentle, Relaxed, or Peaceful, then sink into a lulling succession of sonatas and string quartets.

# NIGHT LIGHTS

When Steve Jobs introduced the iPhone in 2007, he unwittingly changed sleep forever: The device's blue light can block the release of melatonin, a vital hormone that acts as a signal for slumber. It sounds counterintuitive, but the App Store is loaded with aids for reaching dreamland—just make sure to put your phone down after activating one

# HOW TO FALL BACK ASLEEP AFTER YOU'VE ACCIDENTALLY WOKEN UP AT 3 A.M.

Waiting to doze off in bed can increase anxiety and perpetuate insomnia. And it's often a game of diminishing returns. At a certain point—around the 20-minute mark, according to experts—it's better to do something else until you feel sleepy again. Here are a few things to try

## 1 TRY RELAXATION EXERCISES

Deep breathing (slowly, from the belly), meditation, and light yoga can get you back in the mood for sleep. Progressive muscle relaxation is another powerful tool: Tense each body part and then relax it, starting with your toes and legs and moving your way up through your abdomen, arms, and face.

## 2 DO SOME JOURNALING

A 2018 study found that journaling can help reduce nighttime worrying. Write about your day and briefly outline the things you need to accomplish tomorrow. Getting your thoughts on paper might be the trick to shutting off your brain and going to bed.

## 6 READ A BOOK OR LISTEN TO MUSIC

Flip through the pages of a well-worn novel or put on some relaxing tunes, and that might just do the trick.

## 7 MAKE SURE IT'S ACTUALLY DARK IN THERE

A pitch-black bedroom sends a powerful cue to your body that it's time to get some rest. Consider using low-wattage, incandescent lamps at the bedside, and check the room for any other sources of light. Unplug them.

## 8 LOWER THE ROOM TEMPERATURE

Keep your bedroom around 65°F at night for ideal sleeping, assuming standard bedding and clothing. A cool bedroom simulates the ebb and flow of daily temperature, triggering the hypothalamus to release melatonin.

AUDREY MALO

# Same, but Different

A snapshot of sleep from around the world

## JAPAN

Napping in public is called *inemuri*, which translates to "sleeping while present." It's considered a sign of diligence, having worked oneself to exhaustion. The practice has been around for at least 1,000 years and remains common in many white-collar professions.

## SCANDINAVIA

Parents and daycares often leave infants outside to sleep—even in the dead of winter, with the requisite swaddling in wool clothing and warm sleeping bags. These alfresco naps are thought to fortify children's immune systems while helping them sleep longer and more soundly.

## MEXICO

According to a National Sleep Foundation survey, 62 percent of Mexicans regularly pray or meditate in the hour before going to bed. Experts say relaxing activities—like silent reflection—could help get you to sleep faster.

## CHINA

In China, bedrooms often adhere to the principles of feng shui. According to this organizational philosophy, mirrors bounce energy around the bedroom, increasing restlessness and heightening anxiety.

## SPAIN

In Spain, the sun rises and sets significantly later than in the rest of the countries in its time zone. The reason why is political: During World War II, fascist dictator Francisco Franco moved the national clocks ahead by one hour, aligning Madrid's time zone with Berlin's. In practical terms, this has meant prolonged working hours with a long siesta in the middle of the day. Recently, many Spaniards have called to scrap the siesta and adopt a more suitable time zone.

# WHAT DO SHEEP COUNT?

## Understanding how other animals sleep

**FISH, INSECTS, IGUANAS, SCORPIONS, TURTLES**—every member of the animal kingdom needs rest. Even worms, the earth's great sightless wonder, will exhibit behavior reminiscent of satiety and sleep in mammals. Basically, there's nothing uniquely human about an imperative to pass the heck out.

That said, the way other animals sleep is unique. Living under the threat of predation, many species have to get creative. So while some defiantly snooze the day away, others get by on scattered minutes, napping on the go. A few enterprising animals even sleep with just half of their brain, leaving the other half to monitor potential threats.

Like so many other facets of life in the wild, though, we've started influencing the sleeping habits of other creatures. Research suggests that coyotes, elephants, and tigers alter their schedules due to human activity and encroachment. In some cases, species are simply becoming nocturnal in order to avoid our irritating presence.

From bats to dolphins, here's a rundown of how the animal kingdom gets its 40 winks.

### FRUIT FLY (*Drosophila melanogaster*)

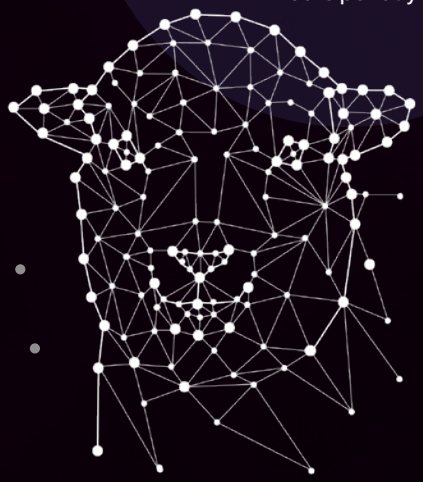
Tiny fruit flies have been observed resting for 10 hours a night and are capable of producing slow-wave sleep.

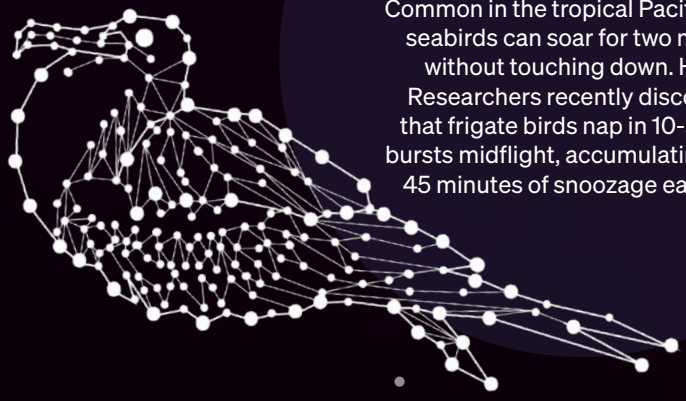
### GIRAFFE (*Giraffa*)

Researchers believe that giraffes sleep so little—four hours per day for calves, but maybe only five minutes at a time, with one eye open, for adults—because of their vulnerability to predators. When they do get some shut-eye, they sometimes wrap their long neck around their back and rest their head on their butt, like a pretzel.

### SHEEP (*Ovis aries*)

Despite popular perception, sheep are intelligent animals with complex social structures and excellent long-term memory. They spend most of the day grazing and ruminating (sound familiar?) but sleep only four hours per day.



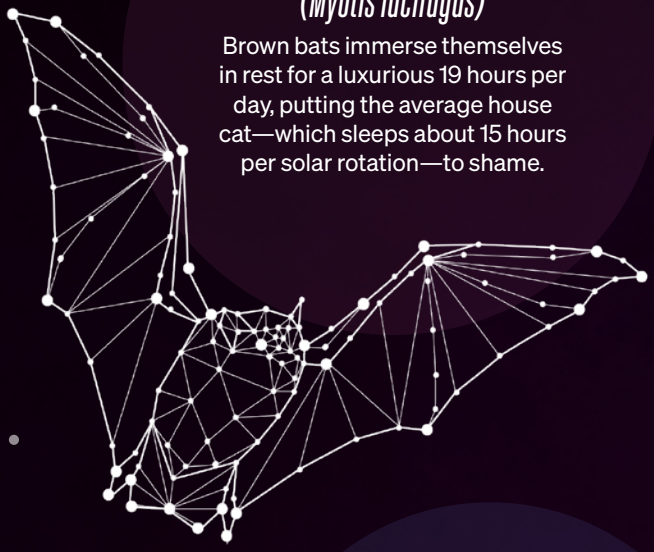


### FRIGATE BIRD (*Fregata minor*)

Common in the tropical Pacific, these seabirds can soar for two months without touching down. How? Researchers recently discovered that frigate birds nap in 10-second bursts midflight, accumulating about 45 minutes of snoozage each day.

## BROWN BAT
*(Myotis lucifugus)*

Brown bats immerse themselves in rest for a luxurious 19 hours per day, putting the average house cat—which sleeps about 15 hours per solar rotation—to shame.

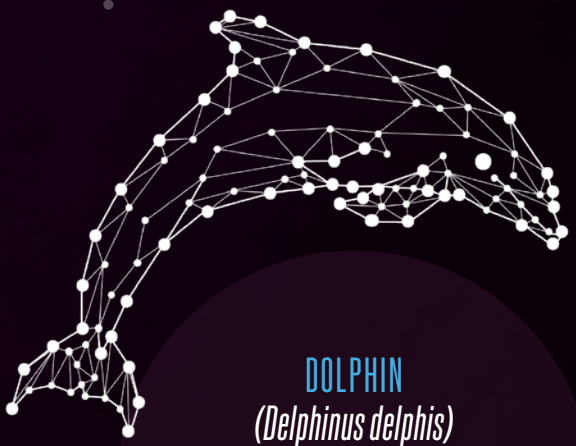


## SEA OTTER
*(Enhydra lutris)*

Sea otters hold hands while sleeping so they don't drift away from one another. Practical *and* adorable.

## SEAL
*(Phoca vitulina)*

Studies show that seals only fully engage in REM sleep on land; in the water, they appear to use slow-wave sleep almost exclusively.



## DOLPHIN
*(Delphinus delphis)*

In the 1970s, the Russian biologist Lev M. Mukhametov found that dolphins swim half asleep, resting one side of their brain first and then alternating in order to complete a full sleep cycle.

## WHITE-CROWNED SPARROW
*(Zonotrichia leucophrys)*

This small bird, with a shock of black and white hair à la Cruella De Vil, is also capable of traveling epic distances without sleep during its migratory period. The sparrow's biology is being studied by the U.S. military for clues about resistance to sleep deprivation.

CLAIRE MCCRACKEN

# THE SURREAL WORLD

Film and TV directors have always loved trippy (and revealing) dream sequences. We ranked a few notable examples

## *ENLIGHTENED*

Season 1, Episode 7 (2011)

This episode of HBO's short-lived *Enlightened* took a unique approach to suffusing a dream scene with significance: it replicated the feeling of floating through a surreal-yet-familiar pastiche of people and places. Like a true nightmare, it begins with everyone that Amy Jellicoe (Laura Dern) knows coming together at a disco-lit party from hell.

**Trippy rating: 4/10**

## *THE SOPRANOS*

Season 5, Episode 11 (2004)

Featuring a bizarre dinner party with Annette Bening (playing herself, not a character), a live horse in a living room, and the ghosts of gangland killings past, this intricate and very long dream sequence brought us into the lively subconscious of a Mafia boss (James Gandolfini). Lust, fantasy, guilt, and revenge are all lurking just below the surface.

**Trippy rating: 6/10**

## *MAD MEN*

Season 4, Episode 5 (2012)

Don Draper (Jon Hamm) dreams about strangling an old flame, Andrea. It's a jarring scene that makes clear his own battles with sexual impulsivity while also commenting on the undercurrent of toxic masculinity in American society during the 1950s. As Matthew says, our dreams are "a form of psychosis." Translation? Yeah, Don's got issues.

**Trippy rating: 7/10**

WESLEY ALLSBROOK

## *CRAZY EX-GIRLFRIEND*
Season 1, Episode 15 (2016)

While aboard a cross-country flight, Rebecca Bunch (Rachel Bloom) is visited by the Dream Ghost, who intends to "give advice you kind of already knew." It's a clever jab at a common television trope, whereby the manifestation of a character's subconscious appears in spectre form, along with a twist that offers a social comment.
**Trippy rating: 5/10**

## *ROMY AND MICHELE'S HIGH SCHOOL REUNION* (1997)

Michele (Mira Sorvino) fantasizes about telling the most popular classmates from her high school that she invented Post-It notes. She recites the recipe for "adding a complex glucose derivative during the emulsification process"—not the actual recipe, but we'll forgive her: This is wish fulfillment at its finest.
**Trippy rating: 8/10**

## *SIX FEET UNDER*
Season 5, Episode 9 (2005)

Much of this seminal episode is spent inside the head of Nate (Peter Krause), who has suffered a fatal stroke. We migrate into the subconscious of his brother, David (Michael C. Hall). When Nate jumps off a cliff, David wakes to learn his brother is dead. The hallucinatory, metaphysical sequence is ambitious, probing the nature of consciousness.
**Trippy rating: 10/10**

## *DUMBO* (1941)

In this infamous scene (critics have called it "nightmare fuel"), Dumbo passes out drunk and sees fluorescent pink elephants morphing into sinister faces and places, including the pyramids of Giza. The scene was apparently the work of Disney's East Coast team, which—unlike their colleagues out West—saw animation as a vehicle for exploring the surreal.
**Trippy rating: 11/10**

# MATTHEW'S TIPS

## LOAD UP ON VITAMIN D

Exposing yourself to natural sunlight for at least 30 minutes a day can help regulate your sleep patterns. Aim to catch those rays in the morning, if possible, and turn the lights down before bedtime.

## LEAVE TIME TO UNWIND

Create a relaxing routine before bed—like reading, listening to music, or doing light stretching. "Keeping a worry journal can also help you process difficult emotions before bed," Matthew adds.

## BATHS ARE BEST

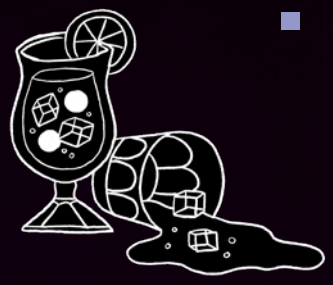
It sounds paradoxical, but taking a hot bath before bed can actually drop your body temperature once you're in bed (in addition to making you sleepier and more relaxed—a real win-win).

## CHECK YOUR DEVICES AT THE DOOR

Think of the ideal bedroom as a prehistoric cave in the Great North: cool, dark, gadget-free. Charge your phone in another room, get rid of electronics that cause noise, and ditch the alarm clock, which makes you hyperaware of every passing minute.

## CUT THE LATE-NIGHT CARDIO

If you're feeling sluggish in the morning, your treadmill could be to blame. For some, a midnight workout too close to bedtime can make it harder for the brain to wind down. Aim to finish heavy exercise two to three hours before hitting the sack.



## TAMP DOWN ON THE MARGS

Alcohol before bed may help you relax, but too much of it robs you of REM sleep. Heavy alcohol can also impair your breathing at night, and the stuff isn't good for staying asleep, either: you tend to wake up multiple times over the course of an evening, even if you don't remember doing so.

*If you suffer from chronic lack of sleep, the Insomnia Severity Index can help ascertain whether your case warrants attention from a doctor. The questionnaire has been made available free here.*

AUDREY MALO

## EAT LIGHT AT NIGHT

When it comes to late-night eating, small snacks are preferable to heavy meals, which can cause indigestion that interferes with your sleep. Don't drink too many fluids, either, or you may find yourself in the bathroom when you could be fast asleep.

## FIND A ROUTINE

Your body's internal clock likes to keep a specific schedule. Going to bed late one night and early the next throws your circadian rhythm off balance. Playing catchup on sleep over the weekend doesn't work as well as you might think. It'll take a bit of planning, but aim to dive under the sheets around the same time every night.

## DON'T JUST LIE THERE

Lying in bed for prolonged periods, hoping you'll finally nod off, isn't an effective strategy; it can actually be counterproductive, making you anxious and frustrated. Your brain will associate bed with being awake if you do anything in it besides sleeping or romantic events. After about 25 to 30 minutes, get up and do a relaxing activity until you start feeling sleepy.

## REEVALUATE YOUR PILL REGIMEN

Some heart and lung medications (and over-the-counter cold and allergy drugs) can disrupt sleep patterns. If you have trouble sleeping, ask your pharmacist or healthcare provider if meds could be the culprit—and whether you might be able to take them earlier in the day.

# FOR SAWING LOGS

## REDUCE THE CAFFEINE AND NICOTINE

Caffeine temporarily blocks brain signals from adenosine, a sleep chemical, which nonetheless continues to accumulate. Like a dam breaking, that pent-up adenosine eventually rushes in, causing a dramatic crash. Nicotine, another stimulant, can lead to very light sleep, too.

Now that you're equipped with much of the knowledge you need to begin retooling your sleeping habits, it's time to put all of it into practice. Here are 11 tidbits of wisdom from the master himself—give them a try, and chances are your slumber will improve in no time

MasterClass